



OPERATING SERVICE MAINTENANCE MANUAL



ALL-STAR ROCKING PISTON COMPRESSOR AND VACUUM PUMP

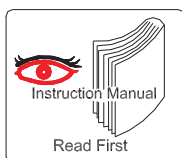
Registered by one or more of these standards agency

Read through carefully and understand these instructions before use.



Contact your supplier or
All-Star Products
Tel 901-755-9613
www.all-star-usa.com

**Have the pump model and serial
numbers when ordering parts or when
contacting All-Star or your supplier.**



**Read the Safety Rules below before
working on the pump.**



-  **DANGER** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
-  **WARNING** Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.
-  **CAUTION** Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury.

NOTE:

This Service Manual is intended for use ONLY by a service center with properly trained and experienced repair personnel. The instructions and warnings contained herein presume existing familiarity with the design and function of this type of product and their components.

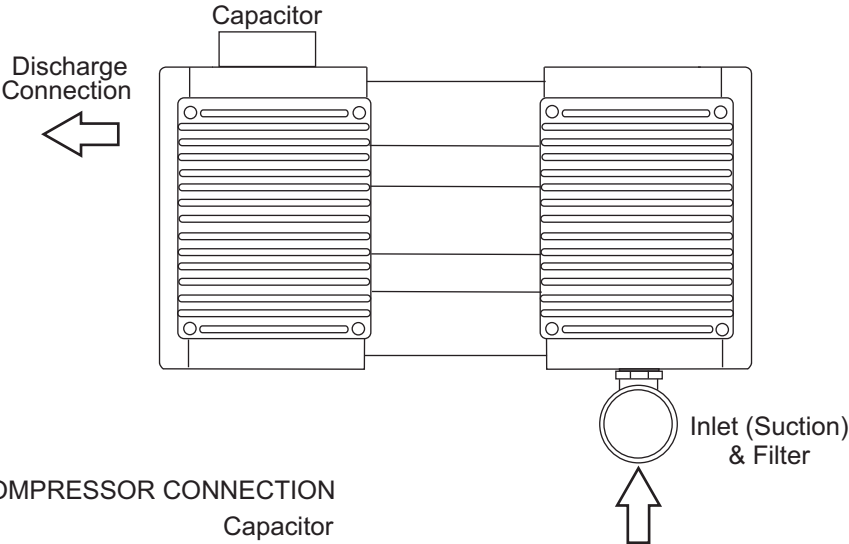
The information contained in this manual is subject to change without prior notice. The manufacturer should be contacted prior performance any maintenance to determine if any changes have been made to the information contained herein, prior to performing any service or maintenance work.

Connection Diagram

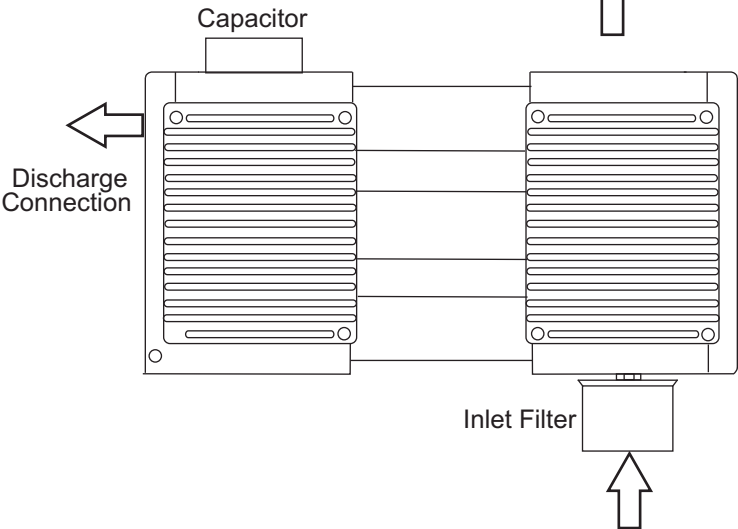
Note: The intake (suction) and the discharge piping should not be smaller than the connections in the unit. The piping can be a larger diameter.

If the unit is used in a network arrangement with other pumps or compressors, the diameter of the piping should not be less than the total surface area of the total number of pumps connected in the network.

VACUUM PUMP CONNECTION



COMPRESSOR CONNECTION



COMMISSIONING



DANGER

This pump and compressor is to be used for pumping non-aggressive gasses (air) containing no more than 22% oxygen. This unit is not approved for nor should be used for explosive or toxic gasses.



WARNING

RISK OF BURNS - DO NOT TOUCH

The surface temperature of the machine can reach 80 Deg C (175 Deg F) when operating at full load conditions. Wait until the unit cools down prior to performing service work.

- 1.0 The unit must be installed in a well-ventilated, dust-free room. The maximum ambient is 40 Deg C (104 Deg F). Intake and discharge air should be piped to limit ambient air temperature as noted above.

The rocking piston pump is designed for continuous duty.

The cooling fins on the unit should remain open to allow free-air circulation and the unit must be located at least 150mm (6 inches) away from any surface. Do not allow hot air to circulate on or about the unit.

STORAGE

If the unit is placed into storage for a period of time greater than one (1) year, it should be stored in a dust free area subject to a maximum temperature of 40 Deg C (104 Deg F), and where it will not be subject to vibration. If stored for longer than one (1) year, the bearings should be replaced prior to start-up.

2.0 Mechanical Connections

If the unit is to be connected to a network, a flexible hose should be installed to eliminate mini-vibrations from reverberating in the system piping. The connections on the unit are either .25" or .375. NPT threads.

For vacuum applications, piping connections to the exhaust orifice can be made to direct the heated discharge air to an exhaust outlet. This piping should not be smaller than the connection on the unit. If a smaller discharge pipe size is used, this can result in reducing the pump speed and could overload the motor.

If multiple units are installed on a network system, the exhaust pipe must equal or be greater than the cross-section of the total diameter of all of the units in the system.

A drain valve at the lowest point of the exhaust line must be installed to prevent any condensation from draining back into the unit(s).

Mounting of unit

The unit should be mounted on an adequate mounting base using the rubber foot pads to isolate any vibration being transmitted to the mounting surface.

ELECTRICAL CONNECTION

The power supply must be the same voltage and frequency as listed on the nameplate. The motor is a single phase, capacitor type and it has one cable connection. Connect the incoming power two conductors to the motor terminals and connect the earth (ground) wire to the earth terminal.

The motor must be protected by a motor starter with a thermal overload. A circuit breaker of adequate capacity, based on the motor nameplate amperage must be used.

A thermal protector is wound into the motor winding that can be use for additional temperature protection of the motor.



DANGER

The motor must always be disconnected from the power supply prior to performing any maintenance on the unit. The electrical disconnect should have a lock-out feature to prevent an accidental start-up while the unit is being serviced.

3 MAINTENANCE

The points mentioned in this section are based upon the pump being applied in what can be considered a normal or standard installation. If the unit is installed or operated in any excessive condition eg, dirty environment, high temperature and so forth, the needs to be maintained frequently.

Cleaning

The external surface of the pump should be cleaned of any debris to allow for effective cooling of the unit.

Annual Maintenance

The silencer should be dismantled and cleaned or replaced if necessary. The filter cartridge should be replaced.

The All-Star rocking piston pump has a designed service life of approximately 10,000 hours. Once the pump reaches this point, or approximately two (2) years, the cylinder head and casing seal needs to be replaced. This period is merely a suggestion and is dependent upon the duty cycle and environmental conditions.

10,000 Hour or Two Year Maintenance

In performing this maintenance, it is recommended to perform the following:

- a) Replace the connecting rods or piston cups and sleeves
- b) Replace the flapper valves
- c) Replace the head O-ring head gasket
- d) Replace the valve plate O-rings

Required tools for blower maintenance

- a) Torque wrench (required for head screws, connecting rod, flapper valve screws and pipe plugs)
- b) Allen head wrench with attachments for torque wrench
- c) Cross-head attachment for torque wrench
- d) Screw driver
- d) Soft, clean cloth

Servicing the Head, Valve Plate Assembly and Connecting Rod and Bearing Assembly - Figure 1

Note: The head would only need to be replaced if it is visibly damaged.

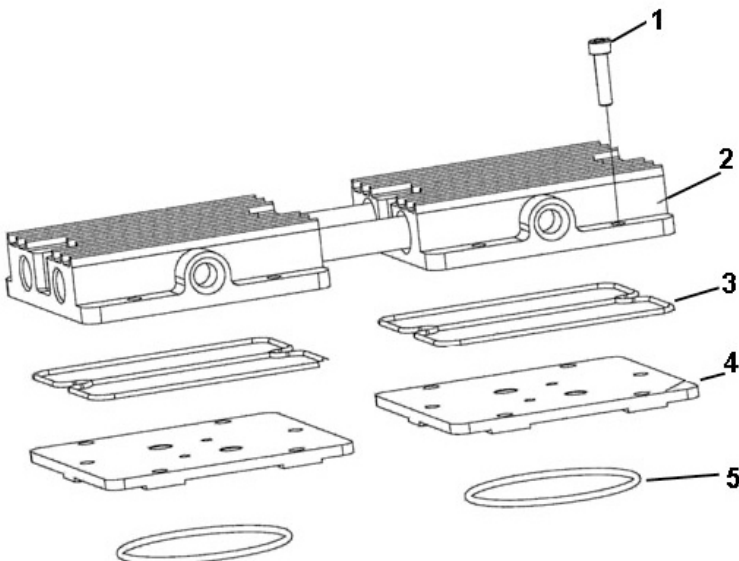
Parts Required:

- Head if damaged
- Head gasket
- Valve plate O-ring
- Complete valve plate assembly or individual flapper valves
- Flapper valve screw (s) if replacing individual valve (s)

Removing the Head

1. Disconnect the power to the motor
3. Disconnect all airlines and remove the unit from any enclosure
3. Remove all screws (1) that fasten the head (2) to the pump housing
4. Carefully separate the head from pump body.
5. Carefully separate the valve plate assemblies (4) from the heads
6. Remove the head gasket O-rings and replace
7. Turn the valve plates over and replace the valve plate gasket O-rings

FIGURE 1



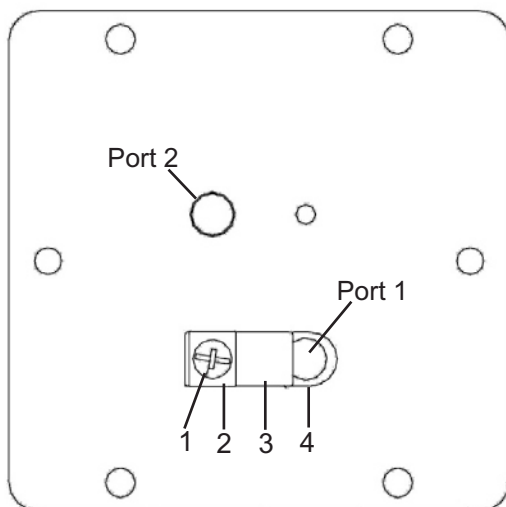
Removing Flapper Valves

Note: It is recommended that you replace one flapper valve at a time. This will help to simplify the repair process and correctly orient the flapper valves in the valve plate.

1. If you are replacing a flapper valve on the topside of the valve plate (the side facing the head), remove the flapper valve screw (1). Lift off the valve keeper strip (2), lift off the strengthened valve (3) and lift off the existing flapper valve (4).
2. Remove any debris from the valve plate with water-free alcohol (soap or other detergent should not be used due to the potential for corrosion from the soap).
3. Place the valve plate on the compressor housing and orient it as illustrated. Make sure the O-ring head gasket is towards the cylinder. Note the orientation of the valve ports.
4. Orient a new flapper valve (4) over Port 1. Observe the location of the end of the flapper valve.

(continued on next page.)

FIGURE 2

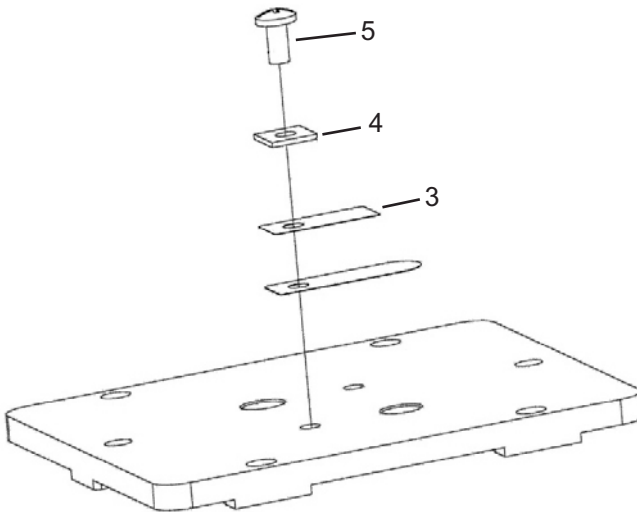


Removing Flapper Valves (continued)

5. Place a valve restraint (3) over the flapper valve
6. Place a valve keeper strip (4) over the valve restraint, observing that the restraint's radius is facing the valve plate and oriented as shown in Figure 3.
7. Line up the screw holes in all of the valve components and fix the screw on the valve plate.
8. Make sure the flapper valve is centered over the port of the valve plate and that all of the other components line up with the flapper valve.
9. Tighten the flapper valve screw to 11.5"lbs using a torque wrench with a screw attachment.

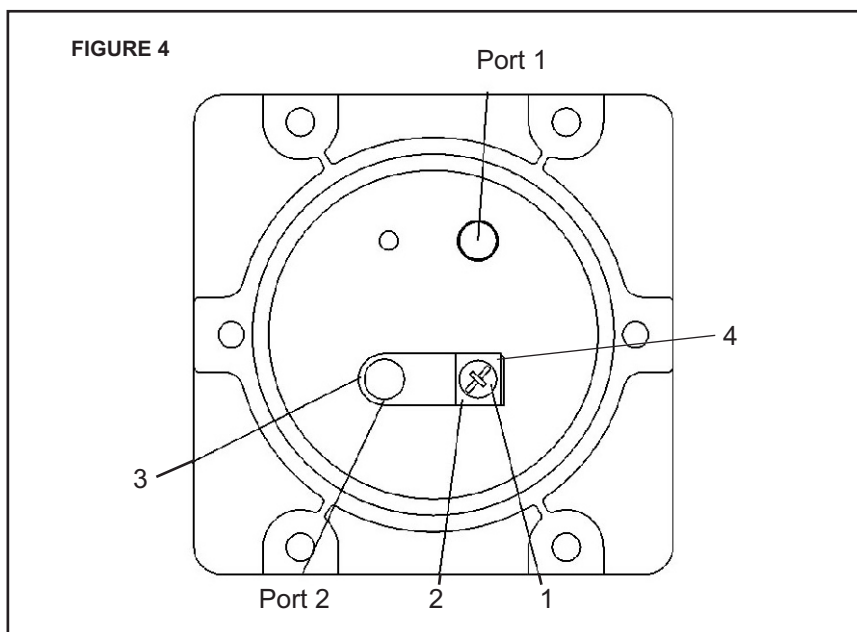
CAUTION: Do not over tighten the flapper valve screw or it will shear off in the valve plate.

FIGURE 3



Replacing A Flapper Valve On The Bottom Side Of The Valve Plate

1. To replace a flapper valve on the bottom side of the valve plate (side facing the pump housing), remove the flapper valve screw (1), lift off the valve keeper strip (2).
2. Clean any debris with a soft, damp cloth. Turn the pump housing head upside down and place the valve plate on the pump head and orient it shown in Figure 4.
3. Orient a flapper valve (3) over Port 2. Observe the location of the notches at the end of the flapper valve.
4. Place a valve keeper strip (4) over the flapper valve, observing that the radius of the valve plate, and oriented as shown in Figure 4.
5. Line up the screw holes in all of the valve components and fix them upon the flapper valve screw by screws.
6. Make sure the flapper valve is centered over the Port and that the valve keeper strip lines up with the flapper valve.
7. Tighten the flapper valve screw to 12.4"lbs with a torque wrench.



Servicing Connecting Rod and Eccentric Assemblies

Note: Refer to the Preventative Maintenance and Troubleshooting guide in this manual to determine whether a complete connecting rod assembly, or it's component parts or an eccentric needs to be serviced.

Components Required

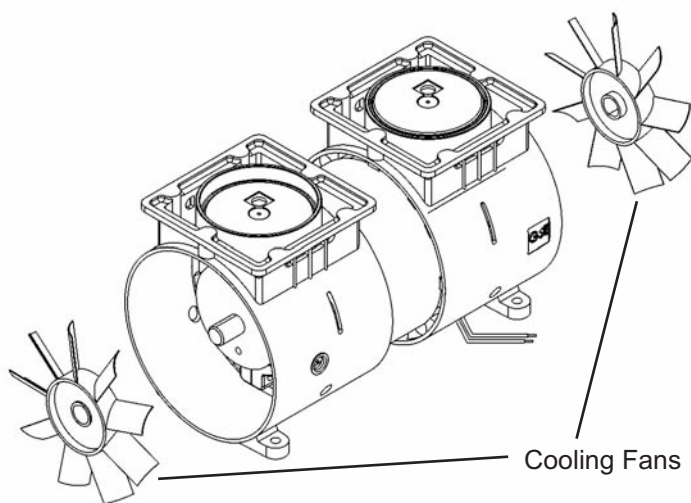
1. Connecting rod assembly, piston cups and sleeves.
2. Valve plate gasket O-rings
3. Head gasket O-rings, if defective

Removing The Connecting Rod and Eccentric Assembly

Note: Only remove one connecting rod assembly at a time.

1. Carefully remove the cooling fan by pulling it straight off the pump shaft. Do not pull the motor fan blades.

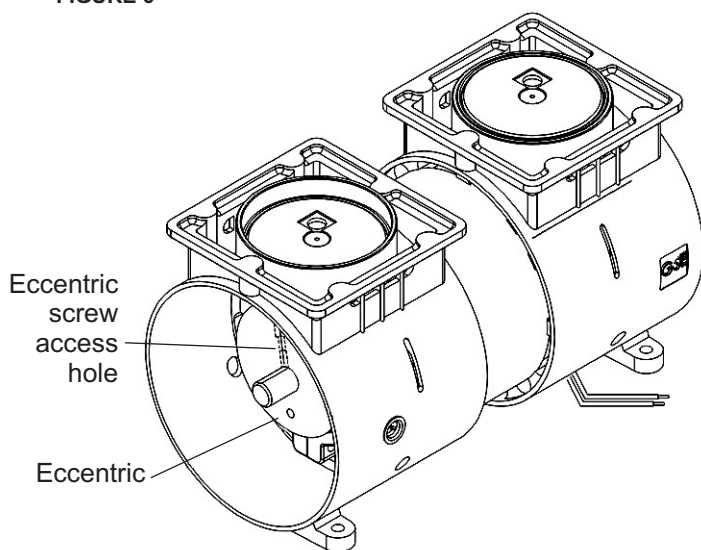
FIGURE 5



Removing The Connecting Rod And Eccentric Assemblies (cont'd)

2. Turn the motor shaft to align the eccentric setscrew, the connecting rod screw separately and with the hole of the housing. See Figure 6 for location of access hole.

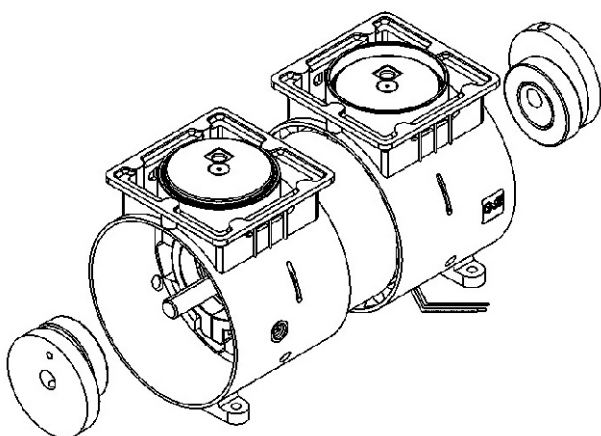
FIGURE 6



Removing The Connecting Rod And Eccentric Assemblies (cont'd)

3. Slide the eccentric bearing assembly straight off the shaft.

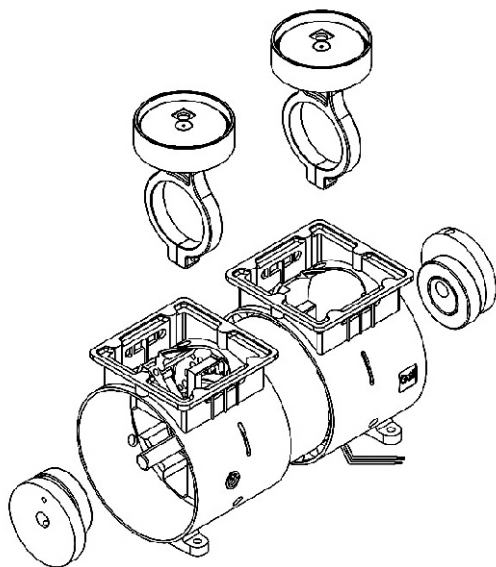
FIGURE 7



Removing The Connecting Rod And Eccentric Assemblies (cont'd)

4. Slide and rotate the connecting rod, remove it from the housing.
Remove the connecting rod and piston from the housing.

FIGURE 8

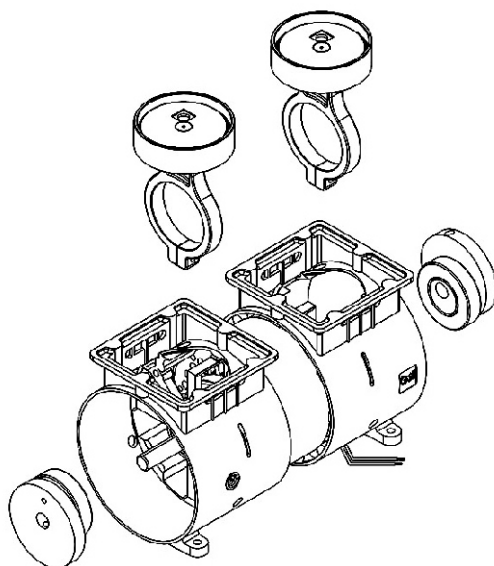


Removing The Connecting Rod And Eccentric Assemblies (cont'd)

4. Slide and rotate the connecting rod, remove it from the housing.
Remove the connecting rod and piston from the housing.

Note: Do not damage the piston cup (4) when removing the connecting rod assembly from the pump housing. If the cup is damaged, it must be replaced.

FIGURE 8



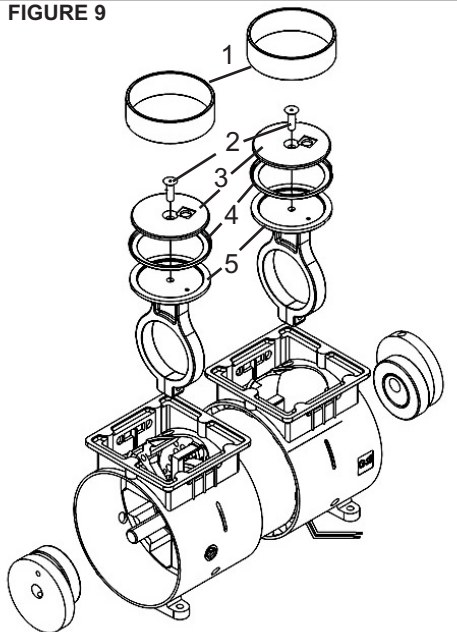
Rebuilding Connecting Rod Assemblies

If you are rebuilding the connecting rod assembly using component parts, follow the procedure below.

When replacing the piston cup (4), be sure to replace the sleeve (1) at the same time. Please the connecting rod in a fixture before attempting to remove the retainer screw. If necessary, heat will help to remove the piston cup.

1. Remove the retainer screw (2) from the cup retainer
2. Remove the retainer (3) from the connecting rod
3. Remove the cup (4) and discard
4. Place the new piston cup (4) on the connecting rod.
5. Place the new piston cup retainer (3) on the cup connection making sure the boss of the retainer is seated in the pilot of the piston rod.
6. Insert the retainer screw (2) into the connecting rod (5) and tighten the screw with a torque wrench to 26"lbs.

FIGURE 9

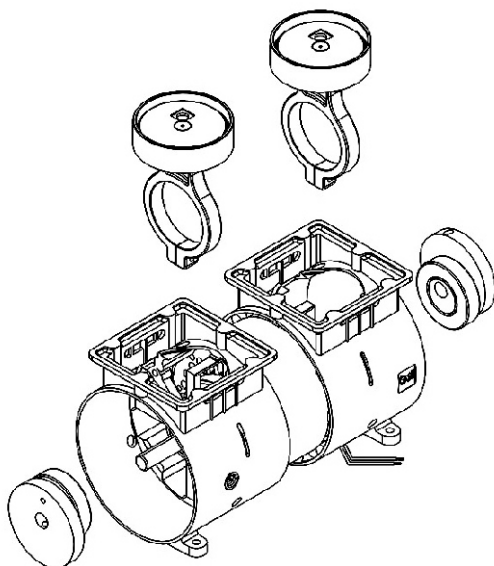


Assembly Of The Connecting Rod To The Pump

1. Put cylinder sleeve into the trough of housing keeper and make connecting rod vertical.

Note: Connecting rod screw to face the housing.

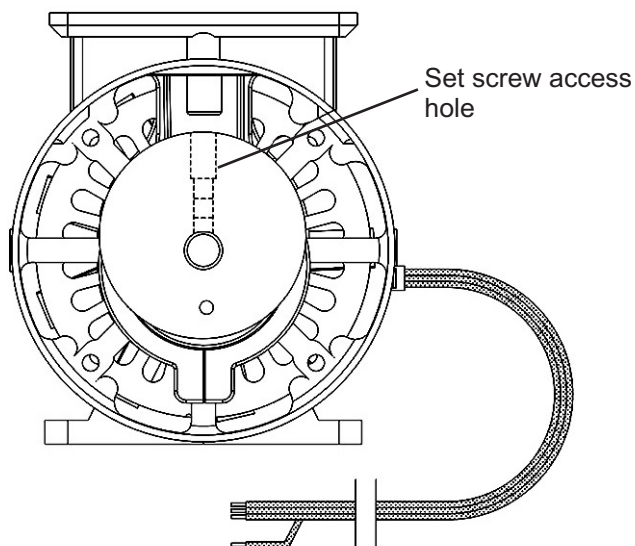
FIGURE 10



Assembly Of The Connecting Rod To The Pump (cont'd)

2. Replace the eccentric onto the shaft and insert bearing into connecting rod bearing housing. Rotate eccentric to line up set screw with access hole in bottom of housing. Rotate main shaft and let shaft flat and eccentric screen hole line up vertically. Tighten screw to with a torque wrench to 35 "lbs.
3. Rotate shaft with connecting rod moving up and down. The connecting rod should move freely with out any obstacle or restriction. Use Allen head wrench to tighten rod screws.

FIGURE 11

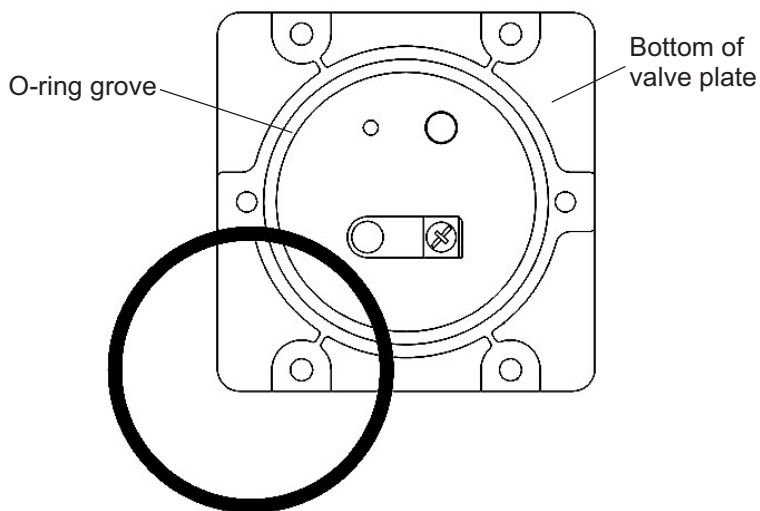


Assembling The Pump

1. After the connecting rod assembly and the eccentric are correctly assembled, assembly of the valve plates and O-ring should be assembled next.

CAUTION: To prevent damage to the pump, never apply any sealant or lubricant to the O-rings.

FIGURE 12

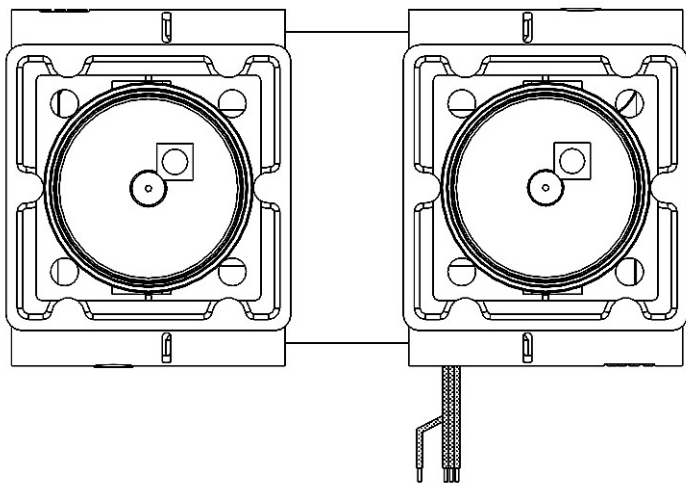


Assembling The Pump (cont'd)

2. Insert the valve plate gasket O-ring into the O-ring groove located on the bottom of the valve plate.
3. Position the pump housing as shown in Figure 13. Note the orientation of the power leads.

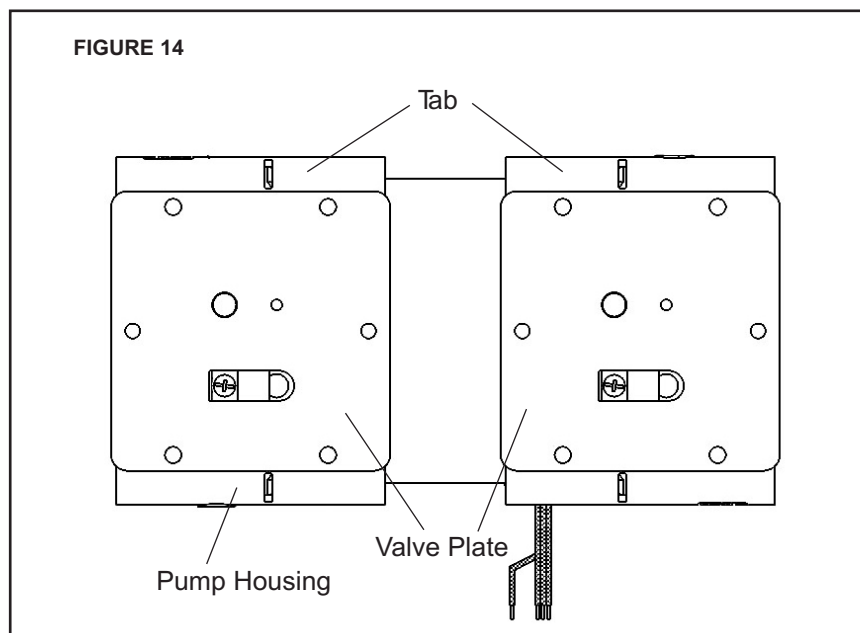
NOTE: Insure the connecting rod sleeves are seated against the pump housing.

FIGURE 13



Assembling The Pump (cont'd)

4. Note the orientation of the valve plate assemblies. Place them on the pump housing as shown in Figure 14



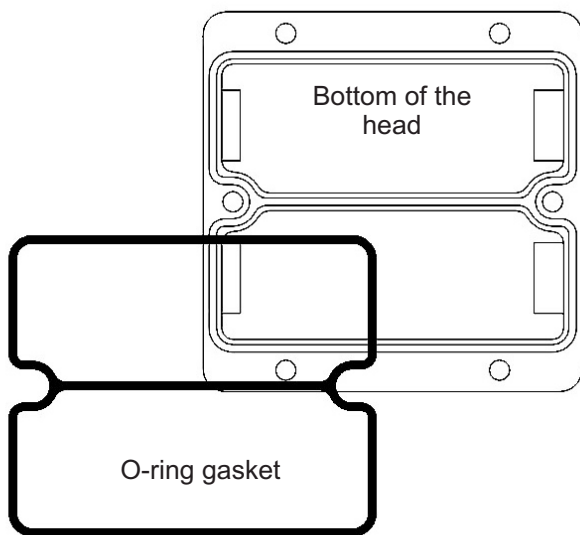
Assembling The Pump (cont'd)

5. Insert two new head gasket O-rings into the groove located on the bottom of the head.

NOTE: Insure the valve plate is properly engaged to the housing locators.

NOTE: Insure that the O-rings are fully assembled in the grooves and that they are not pinched.

FIGURE 15



Assembling The Pump (cont'd)

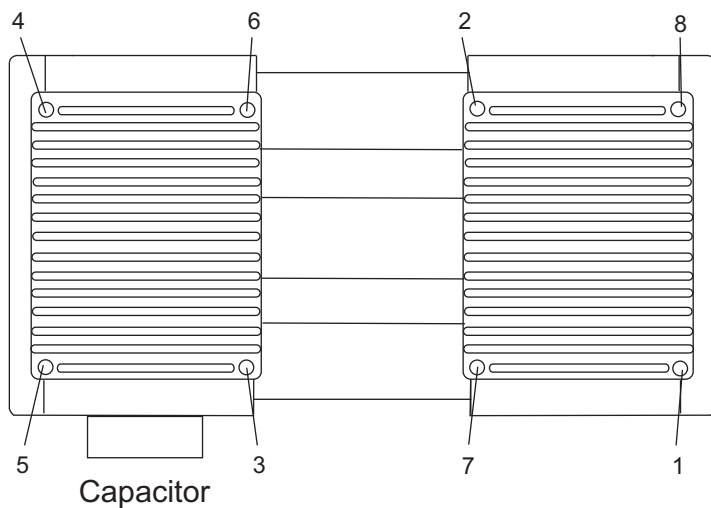
6. Place the head on the valve plate assemblies, observing the position of the air intake and exhaust ports.

NOTE: Make sure the head gasket O-rings are not pinched.

7. Insert the head screws and tighten each screw in the order as shown in Figure 16, until it is snug. Used a torque wrench with a screw adapter to tighten each head screw to 31"lb setting.

! CAUTION To avoid property damage or personal injury, always rotate the fan by **HAND** initially, and prior to connecting the motor to a power supply. Check for suction at the air inlet port by placing one finger over the port as you turn the fan. You should feel a slight suction with each rotation of the fan. If you don't feel suction or if you hear a "thump" as you turn the fan, **DO NOT CONNECT THE UNIT TO YOUR POWER SOURCE**, and review the assembly procedure to determine the problem.

FIGURE 16

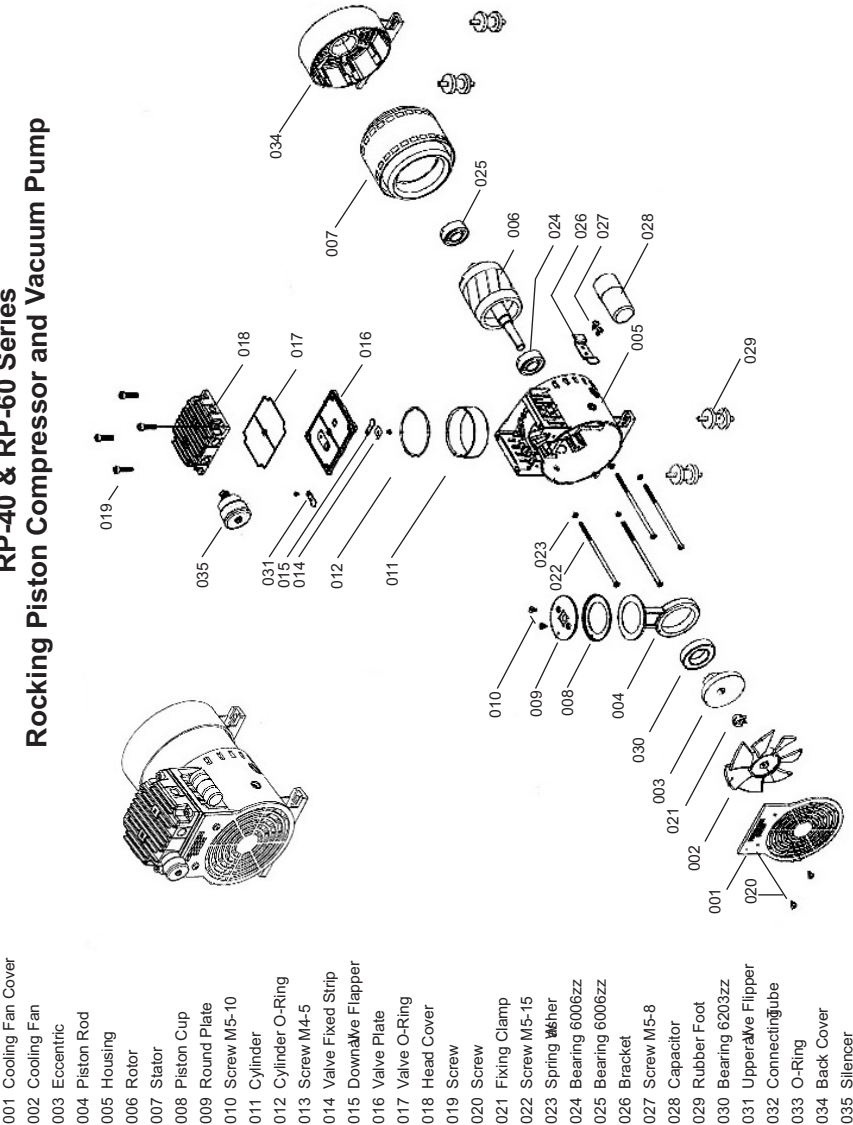


Troubleshooting Guide

Motor Does Not Start	Possible Cause	Corrective Action
	Low voltage supply	Insure rated voltage is applied by changing power supply.
	Bent motor shaft	Replace entire unit
	Worn bearings	Replace bearings
	Burned out fuses	Check incoming power and use only "slow blow" fuses
	Motor starter thermal protector	Check to see if thermal protector has tripped
	Piston jammed	Dismantle cylinder head and repair
Motor Overheats	High voltage supply	Insure rated voltage is applied by changing power supply
	Low voltage supply	Same as high voltage
	Broken fan	Replace fan
	Bent motor shaft	Replace entire unit
	Damaged capacitor	Replace capacitor
	Overload condition	Reduce pressure/vacuum to bring motor amps down to nameplate rating
	High ambient/poor ventilation	Insure the motor ambient does not exceed 40 Deg C
Motor Starter Trips	Starter OL set incorrectly	Verify starter OL is set correctly.
		Check fuse size
		Reduce pump load
		Clean air filter & element
Low Pressure/Low Flow	Installation Leak	Correct any leakage
	Wrong direction of rotation	Change electrical connection
	Piston joint not working	Replace
	Defective blade valve	Replace
	Dirty air filter	Clean and/or replace
	Pump undersized for load	Replace with larger unit
	Loose head screws	Tighten screws
	Damaged valves	Replace valves
	Worn cup	Replace cup
	Damaged gaskets	Replace gaskets
	Debris in valves	Clean and check for valve damage
Noisy Unit	Damaged valves	Replace
	Debris in valves	Clean and check for valve damage
	Worn cup	Replace
	Loose head screws	Tighten screws
	Bent motor shaft	Replace unit
	Worn bearings	Replace bearings
	Silencer	Replace silencer

To insure you received the correct parts, you need to provide the model number of the unit and the serial number, along with the part number as shown below.

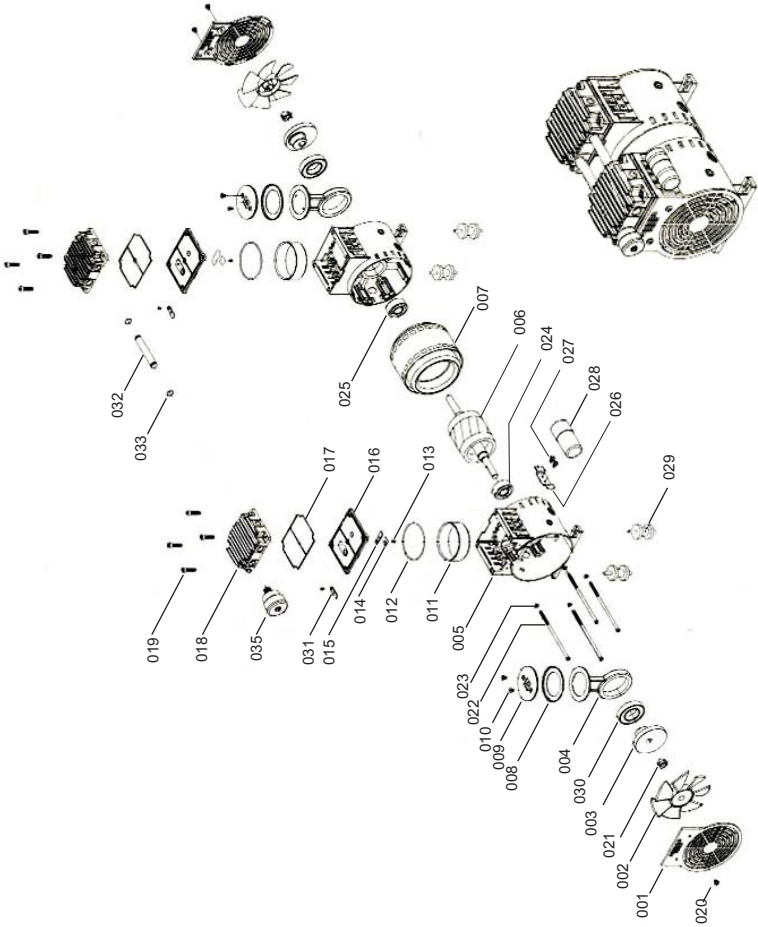
RP-40 & RP-60 Series Rocking Piston Compressor and Vacuum Pump



To insure you received the correct parts, you need to provide the model number of the unit and the serial number, along with the part numbers as shown below.

**RP-90, RP-120, RP-140, RP-180, RP-200 Series
Rocking Piston Compressor and Vacuum Pump**

- 001 Cooling Fan Cover
- 002 Cooling Fan
- 003 Eccentric
- 004 Piston Rod
- 005 Housing
- 006 Rotor
- 007 Stator
- 008 Piston Cup
- 009 Round Plate
- 010 Screw M5-10
- 011 Cylinder
- 012 Cylinder O-Ring
- 013 Screw M4-5
- 014 Valve Fixed Strip
- 015 Down Valve Flapper
- 016 Valve Plate
- 017 Valve O-Ring
- 018 Head Cover
- 019 Screw
- 020 Screw
- 021 Fixing Clamp
- 022 Screw M5-15
- 023 Spring Washer
- 024 Bearing 6006zz
- 025 Bearing 6006zz
- 026 Bracket
- 027 Screw M5-8
- 028 Capacitor
- 029 Rubber Foot
- 030 Bearing 6203zz
- 031 Upper Valve Flipper
- 032 Connecting Tube
- 033 O-Ring
- 034 Back Cover
- 035 Silencer



All-Star products are high quality engineered and manufactured blowers. They are designed to meet international standards and have received approvals and recognition from one or more, of the following.

Registered by one or more of these standards agency



LIMITED WARRANTY

All-Star Products warrants all of its products against defects in material and workmanship for a period of one (1) year from the date the product was placed in service, within a maximum of eighteen (18) months from the date of shipment, whichever occurs first. Purchaser is responsible for providing adequate and approved storage during the eighteen (18) month period. Notwithstanding the foregoing, any equipment or components of the products not of All-Star Products manufacture and/or specified by the Purchaser, is sold under only such warranty as the make thereof extends\ to All-Star Products and All-Star Products is able to enforce, but such items are not warranted by All-Star Products in anyway. All-Star Products is not responsible for product failures caused by the Purchaser or their customer misapplying the product, operating the product beyond the published ratings and values, misuse, field alterations and changes, lack of proper maintenance or improper storage. Neglect or accidents are also excluded from this Limited Warranty. This Limited Warranty is effective provided (1) the purchaser immediately notified All-Star Products in writing of the alleged defect after it becomes known to the purchaser and (2) no alterations, repairs or services have been performed by the Purchaser or third parties on the product without written approval of an officer of All-Star Products (3) a properly sized air filter has been installed.

This Limited Warranty does not cover misuse, misapplication, abuse, neglect or other causes of failure beyond the All-Star Products control. The product should not be disassembled or a repair attempted. Any attempt to disassemble or repair to correct a problem by the customer or their agent, will void the Limited warranty. A disassembled unit will not be considered as a warranted failure under any circumstances.

For more information, visit <http://www.all-star-usa.com>

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